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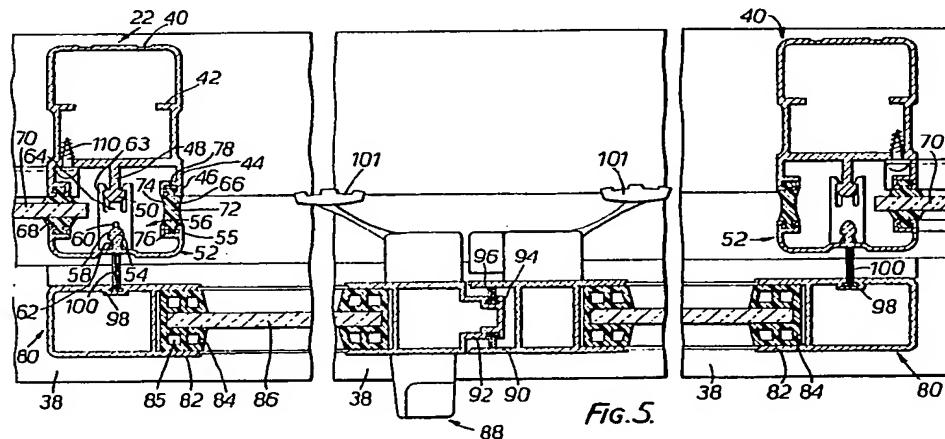
(58) Field of search

E2A F2M

## (54) Resilient clips for glazed structures

(57) A kit of parts for a glazed structure comprises extensions suitable for uprights, at least one roof bar, at least one ridge bar and roof ties. A transition section in each upright to the corresponding roof bar is of arcuate form. The components are interconnected so that the securing means are invisible from internally and externally of the completed structure.

The resilient clip 56 is generally H-shaped in section to define two pairs of snap fit jaws for engaging correspondingly shaped ribs on extrusions 40, 52 being joined together. One jaw is shaped to receive an ogival-section rib 54 and the other a trapezoidal section rib 50 so that rib 54 will be preferentially released when the extrusions 40, 52 are forced apart. The clips are used in glazed lean-to structures having suitable extrusions forming uprights, roof bars and ties, the clips securing cappings which conceal the screws, bolts, etc connecting the extrusions. As shown the structure has one wall which is curved at its upper end to meet the pitched roof that wall carrying a correspondingly curved door slidable on rollers at its top and bottom edge. The capping may also serve as glazing bars. The structure has a concealed gutter.

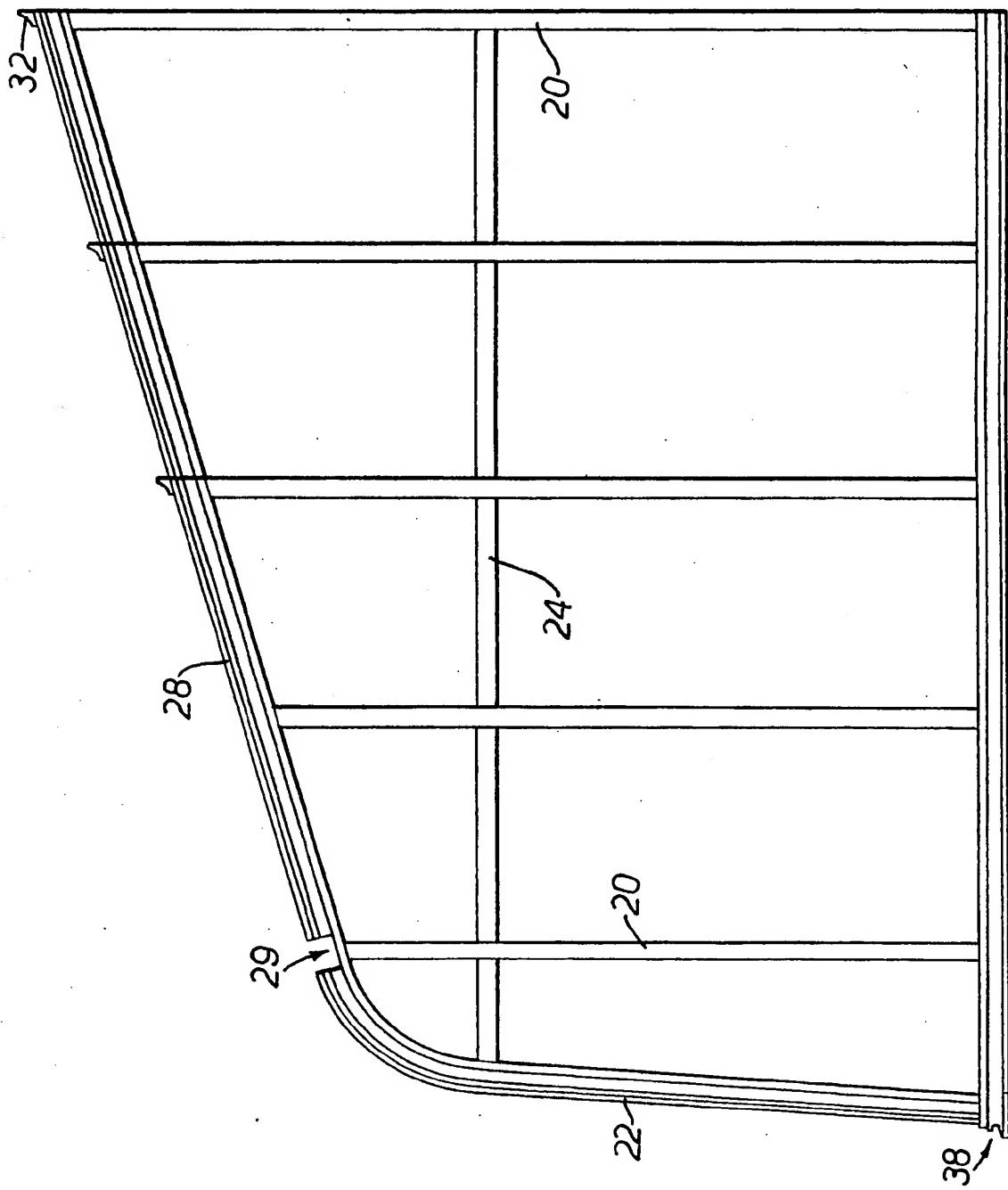


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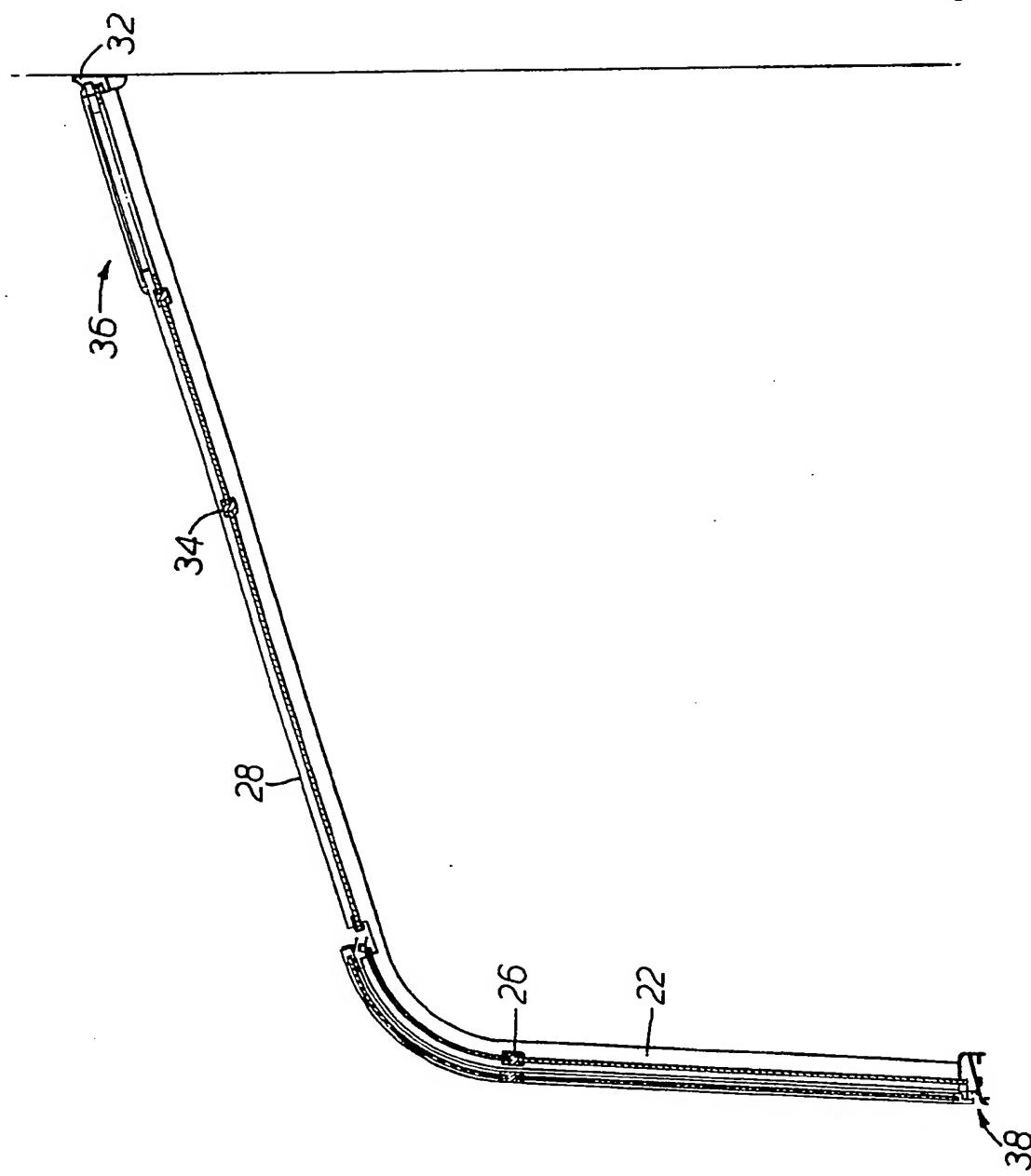
Fig.



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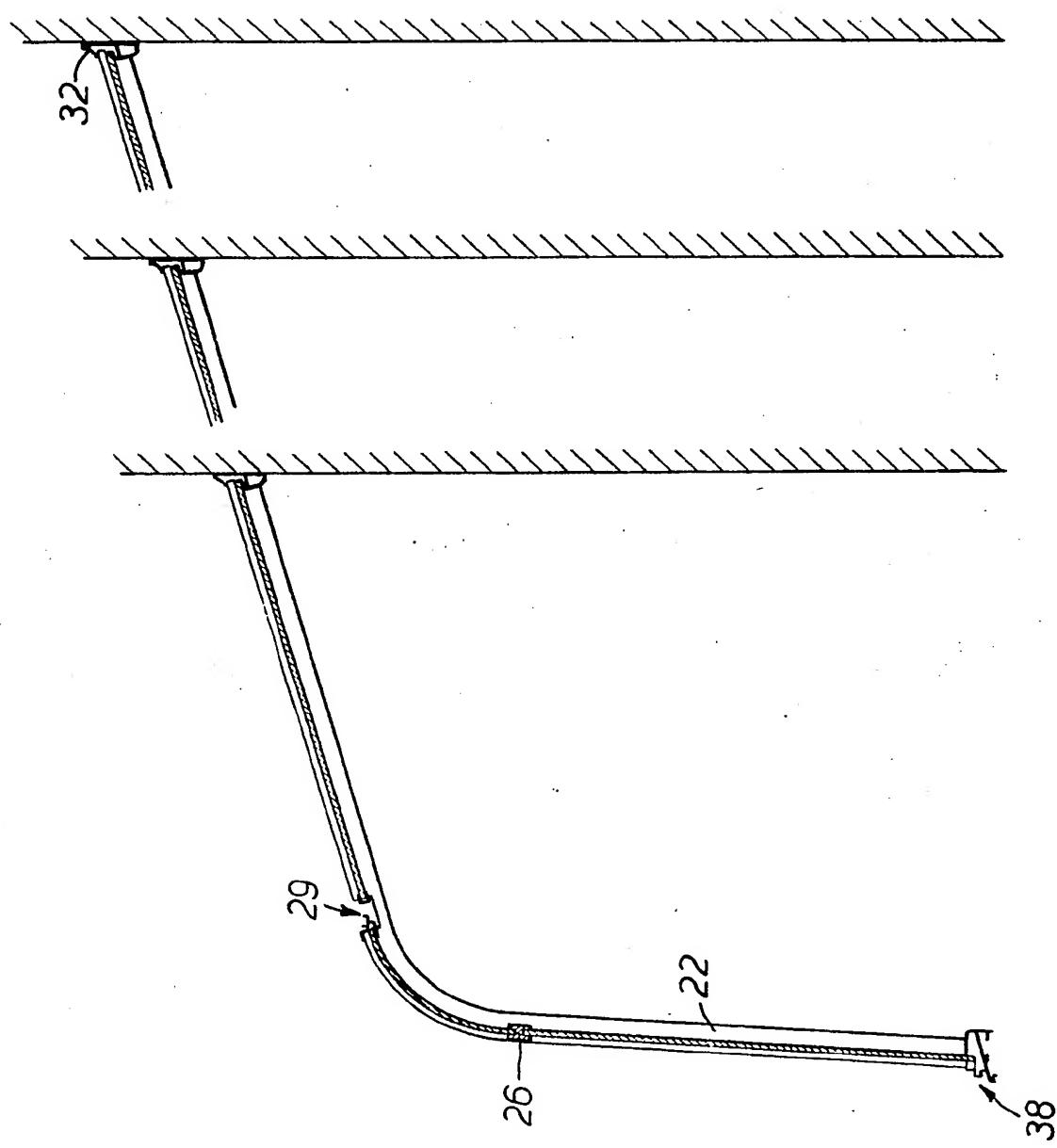
FIG.2.



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FIG. 3.



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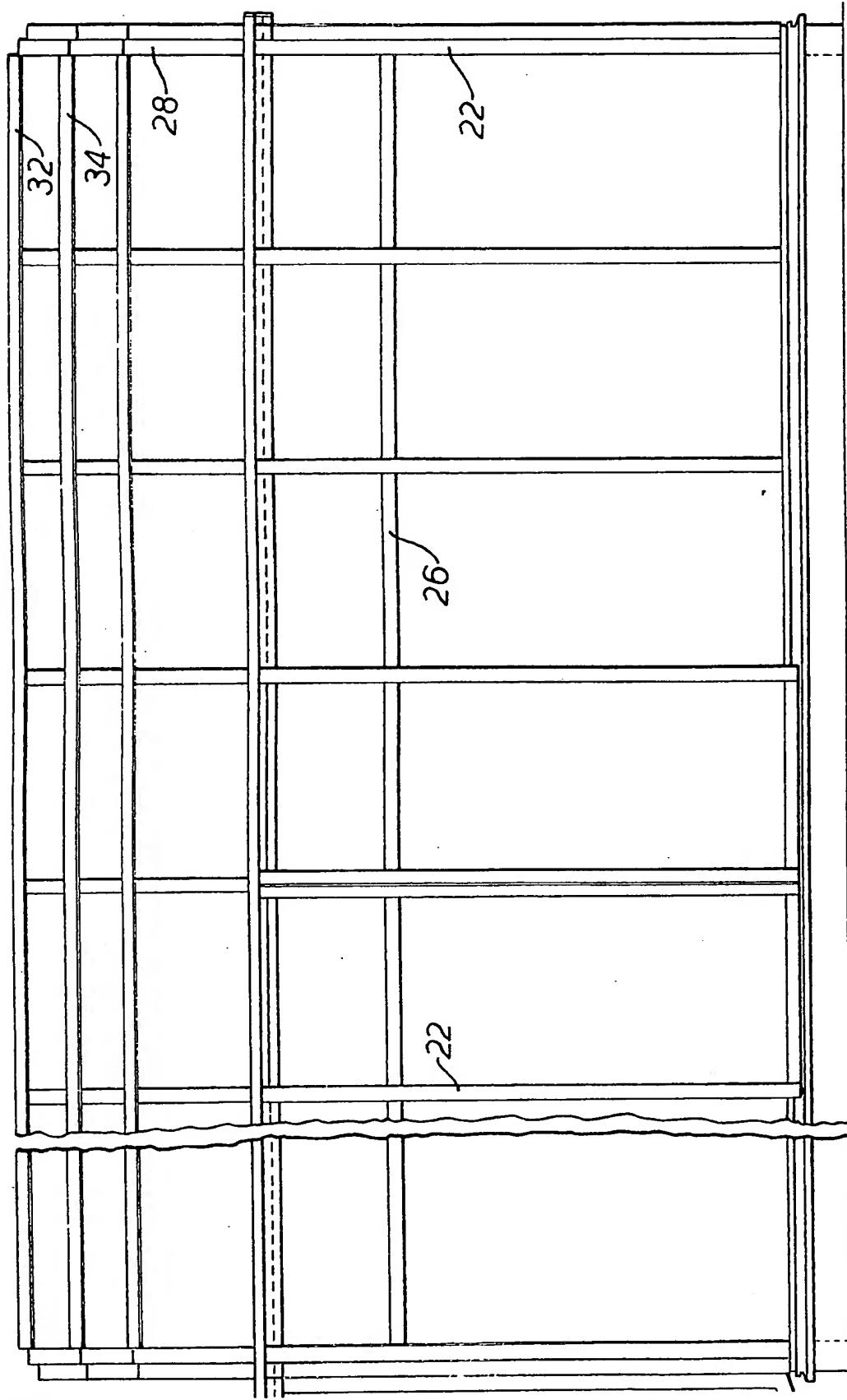


Fig.4.

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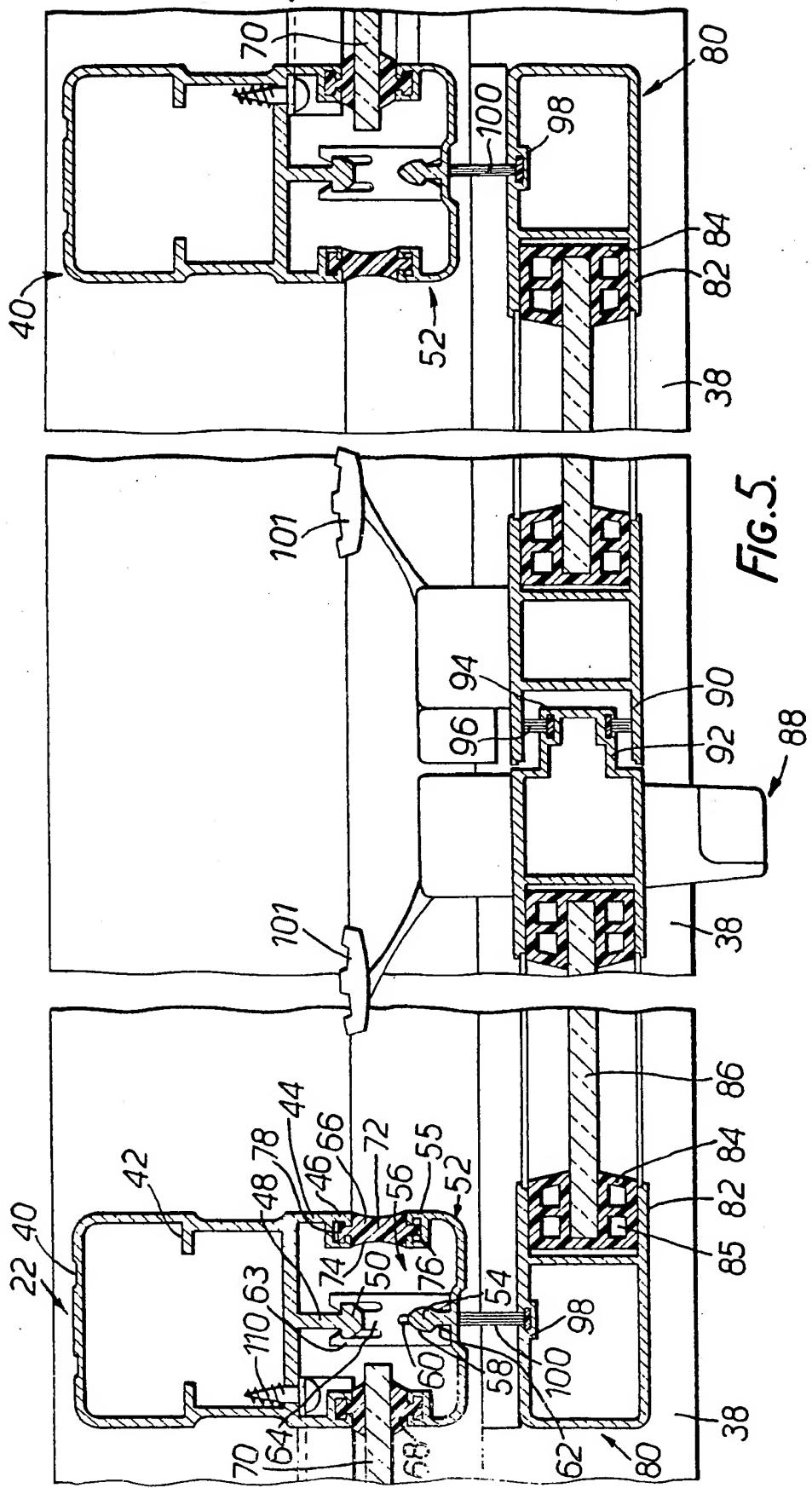


Fig. 5.

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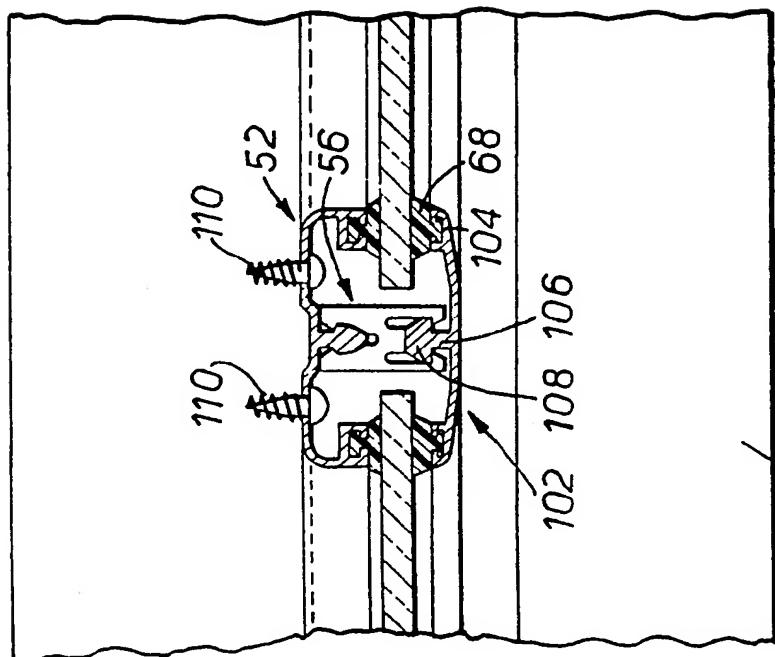


FIG.6.

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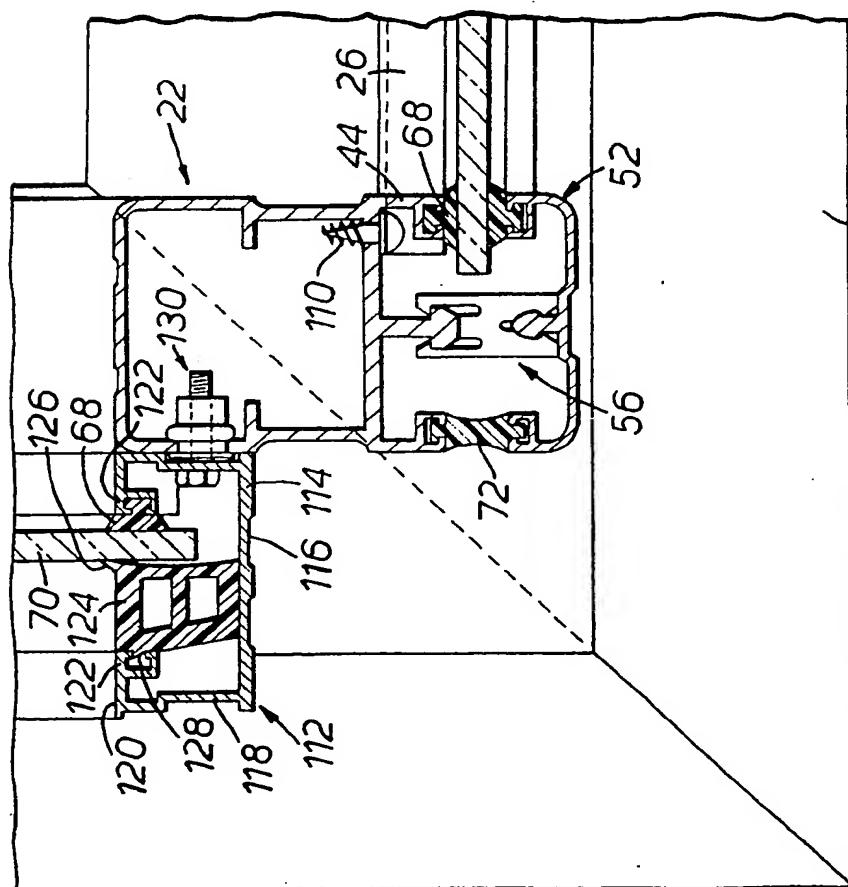


FIG.7. 38

FIG.8A.

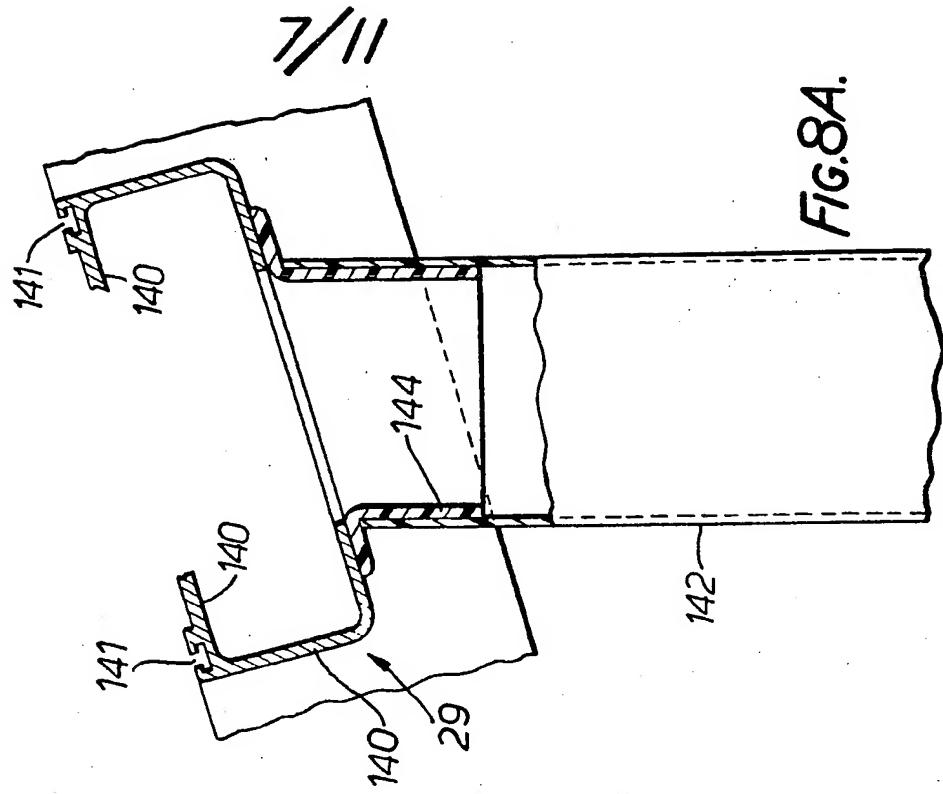


FIG.9.

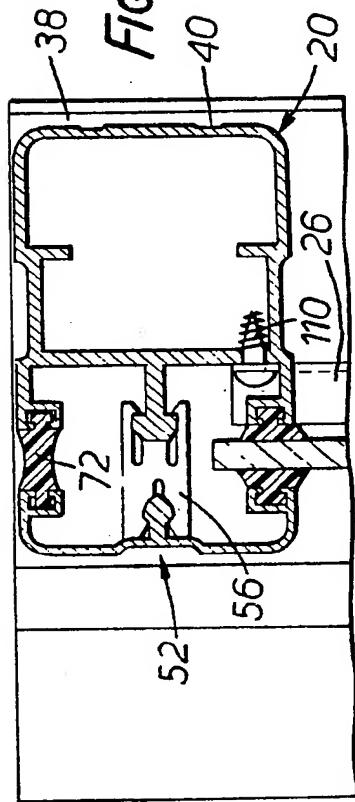
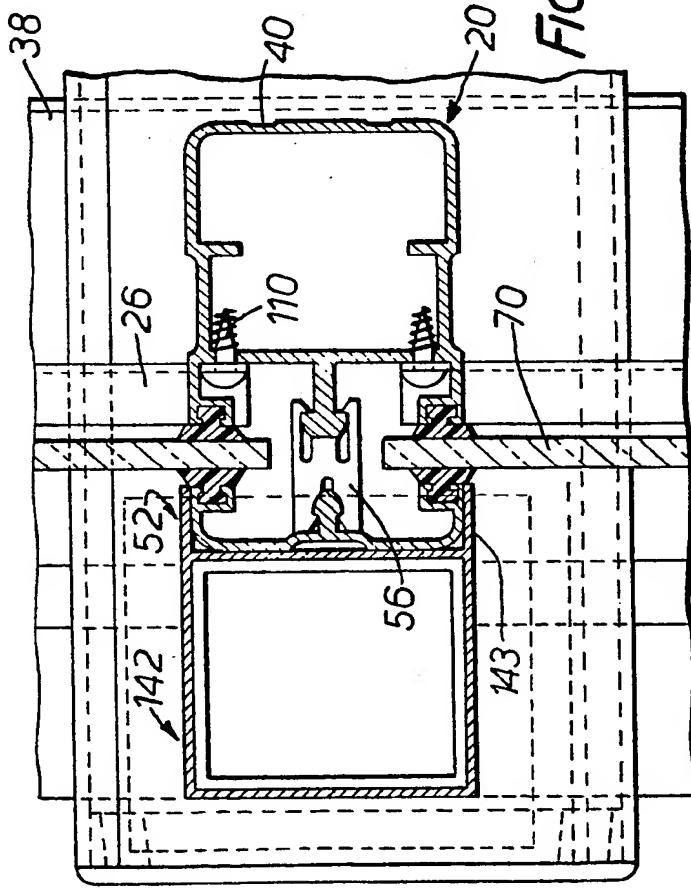


FIG.8.



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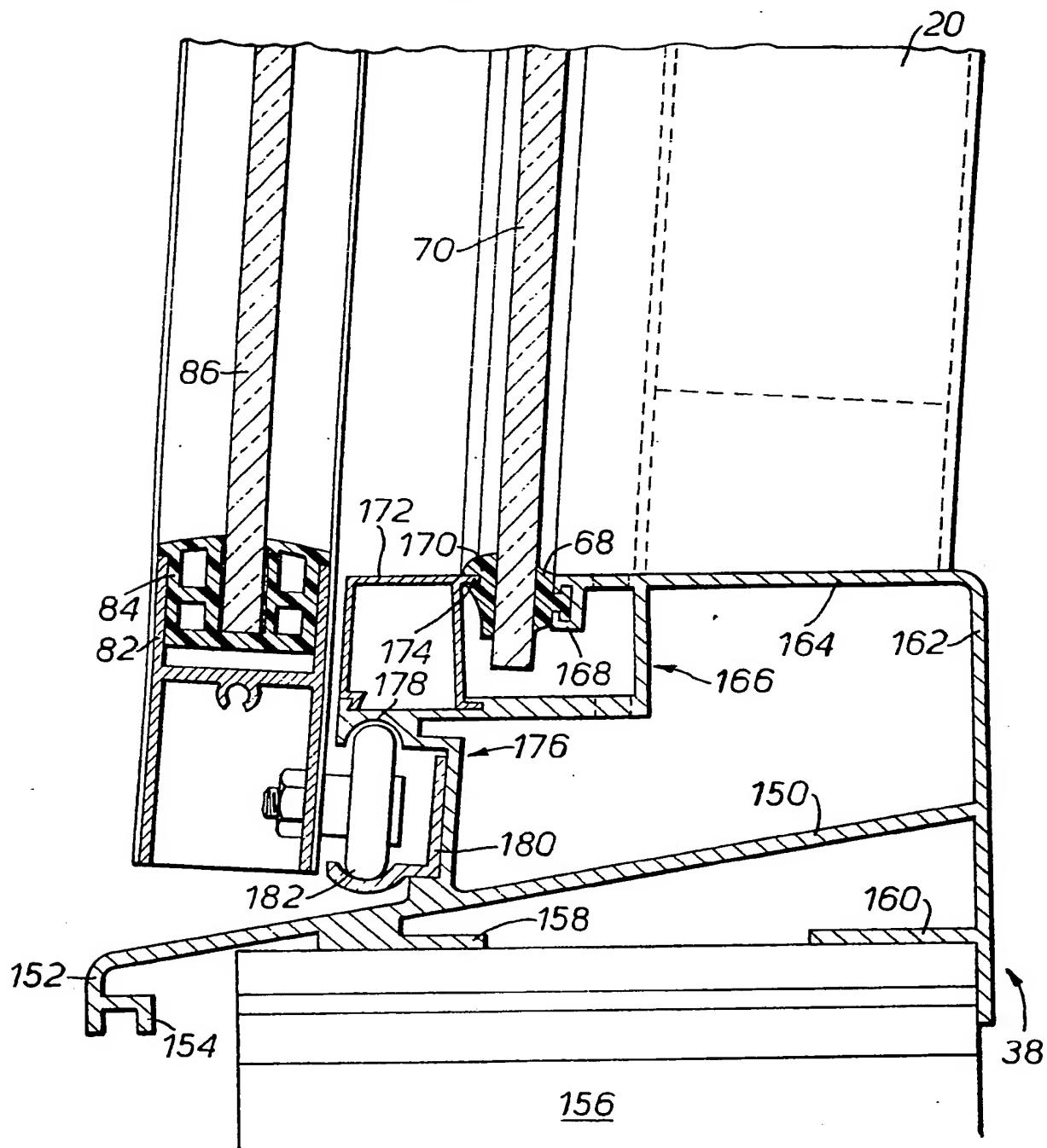


FIG. IO.

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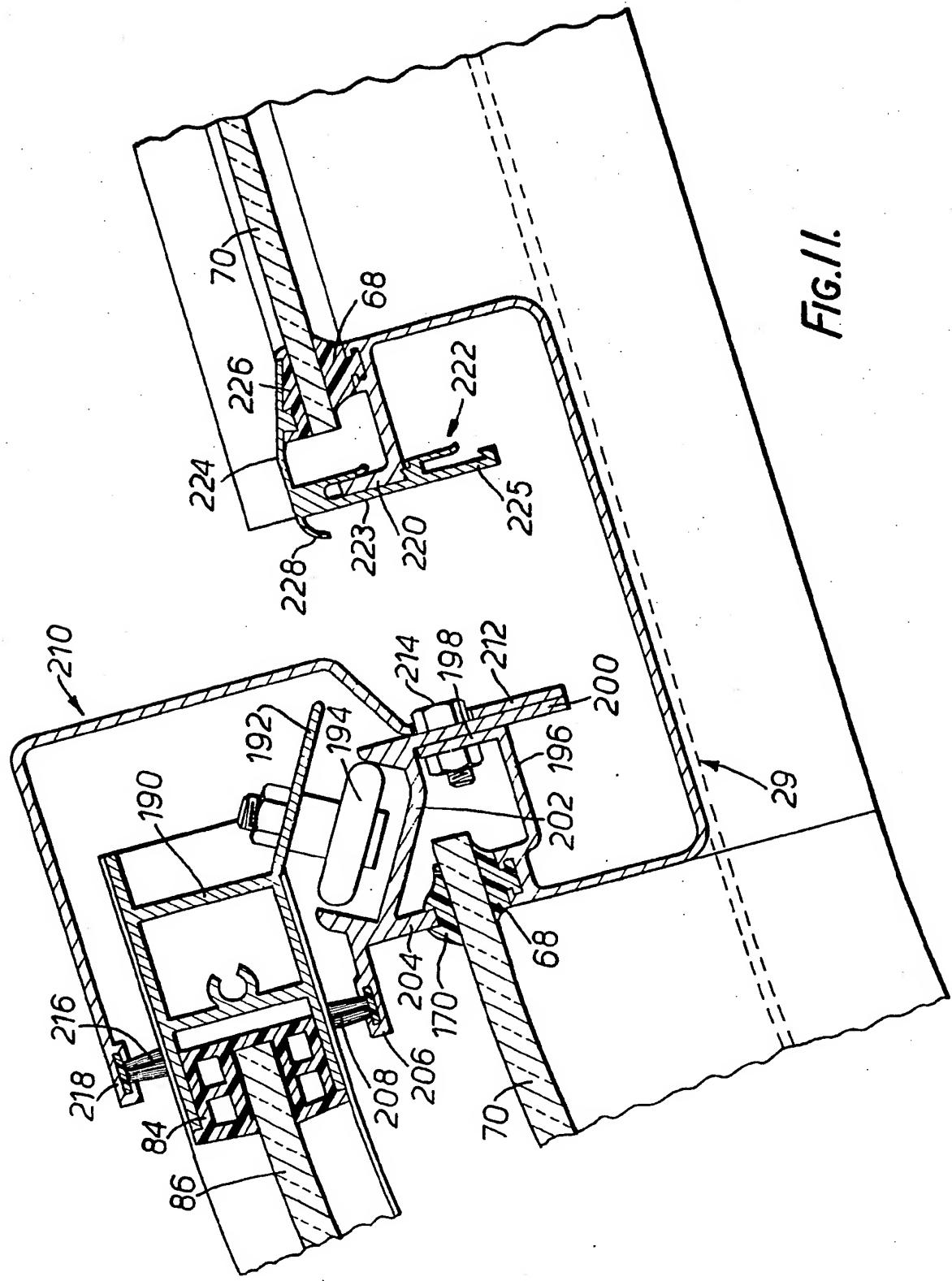


Fig. III.

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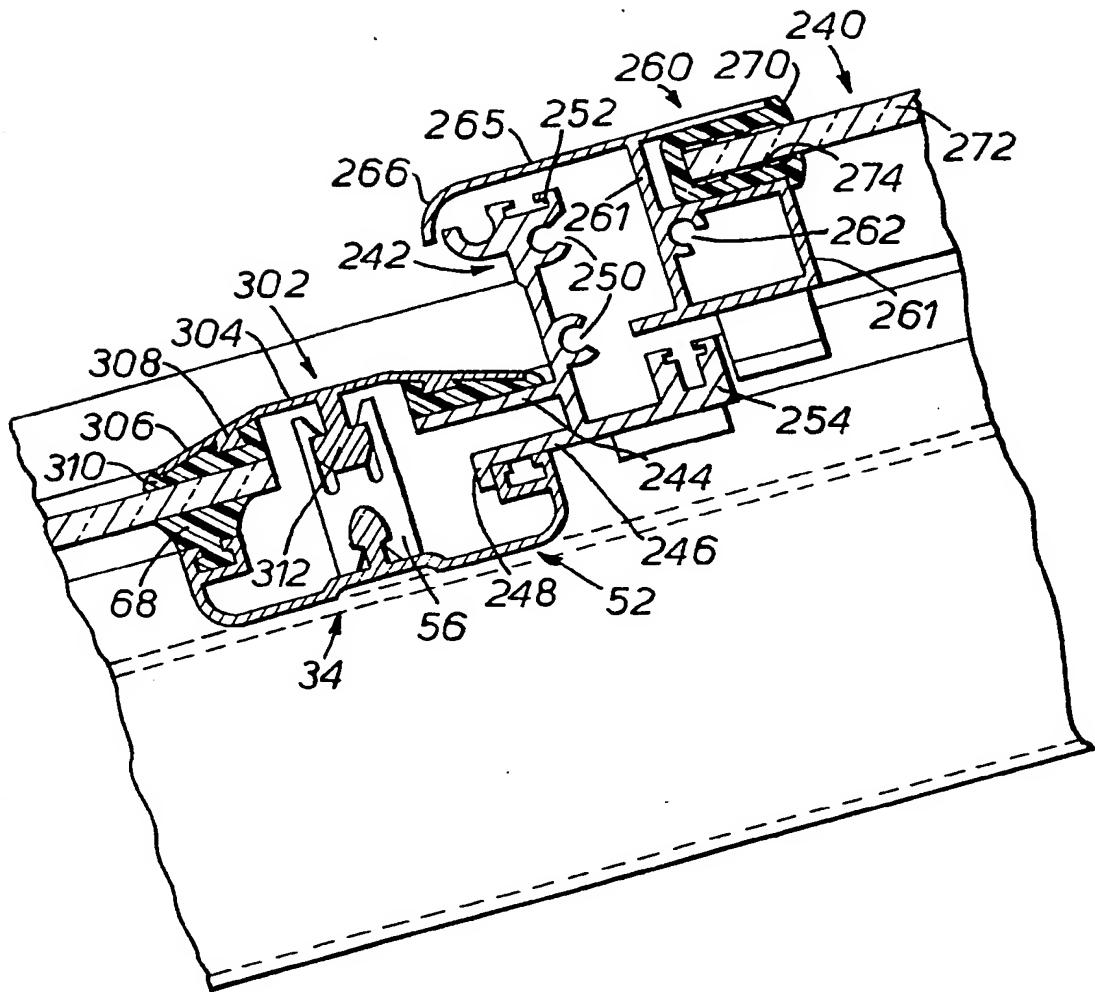


FIG.12.

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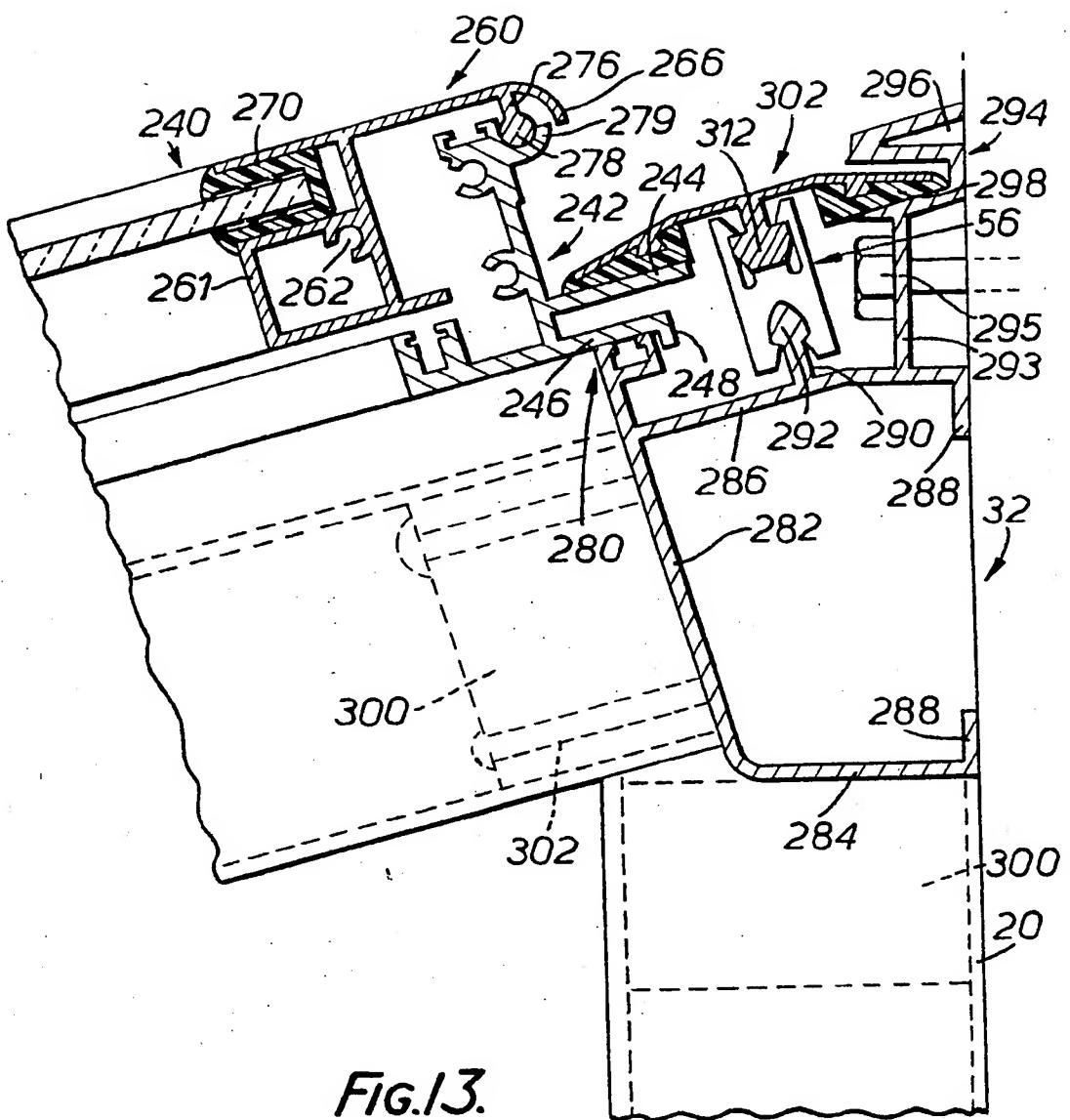


FIG.13.

**SPECIFICATION****Glazed structures**

5 This invention relates to glazed structures built up from extruded aluminium, light alloy, solid or rigid framed plastics sections.

Domestic greenhouses and commercial glass houses have been made of aluminium extrusions for 10 many years but both forms of structure have a strictly utilitarian purpose with a result that appearance is generally a secondary consideration. Aesthetically pleasing glazed structures known as conservatories were commonplace in the nineteenth century, but 15 were constructed of cast iron and have now become of prohibitive cost. Most aluminium and light alloy structures previously proposed of the kind referred to involve the use of visible fixing means such as screws and cleats and it is clearly desirable to avoid these 20 unsightly features in a structure which is intended for relaxation and, desirably, constitutes an addition to an existing house which enhances the overall appearance.

While it is possible to devise a structure which 25 avoids the above disadvantages if sufficient on site work is carried out, this tends to be costly and it is therefore also desirable that a glazed structure for leisure and/or recreational purposes and forming an attractive addition to a main house should be capable 30 of production at a reasonable cost and assembly with a minimum of man-hours.

Furthermore, with a view to reducing costs from the early stages of production, through the stage of storage of parts to the erection stage on site, it is 35 desirable that the number of components should be kept as low as possible consistent with adaptability to customer requirements.

According to the present invention in one aspect there is provided a kit of parts for forming a glazed 40 structure comprising aluminium, light alloy or plastics extrusions including uprights, at least one roof bar, at least one ridge bar and roof ties, the transition section in each upright to the corresponding roof bar being of arcuate form and the component parts being interconnected by securing means which are invisible both 45 internally and externally of the assembled structure.

According to the present invention in a second aspect, there is provided a glazing structure comprising aluminium, light alloy or plastics extrusions 50 formed as uprights and as roofing bars and further comprising transverse members interconnecting the uprights and further transverse members interconnecting the roofing bars, the members forming the roofing bars having a capping member which serves 55 to secure the glazing and the transverse and further transverse members each including a said capping member and a further, external, cover member.

According to the present invention in a third aspect there is provided a plastics clip serving to interconnect 60 two aluminium or light-alloy extrusions, the clip being

of generally H section with one end defining a slot of approximately ogival section which serves to engage with a snap action, a part of an aluminium or light alloy extrusion and at the other end a slot defined by two

65 flange-like members with lips adjacent their free ends, the lips being adapted to snap over a part of a rib of another aluminium or light alloy extrusion, the configuration of the parts of the clip defining the slots differing at the one end from that at the other.

70 According to the present invention in a fourth aspect there is provided an assembly including a cleat interconnecting two aluminium, light alloy or plastics extrusions, the said cleat having an external profile corresponding substantially to the internal profile of 75 one of the extrusions to be connected, apertures in the cleat capable of receiving self-tapping screws, means defining screw-receiving apertures serving by means of self-tapping screws to lock the cleat in a required position on a portion of the other of the extrusions to 80 be connected, and further self-tapping screws passing through and engaging in the first-mentioned apertures of the cleat whereby to secure the said one member to the cleat and all said screws being so mounted that in the assembled condition they are 85 hidden by other components associated with the extrusions.

According to the present invention in fifth aspect there is provided a sliding door assembly comprising a lower support track formed of an aluminium, light

90 alloy or plastics extrusion of rectangular or square section, rollers rotatable on axes transverse to a lower portion of a door, each roller being mounted in an anti-friction bearing, the door having a profile including a curved upper portion and carrying at or adjacent 95 the upper edge further rollers which engage a guide formed by an extended section member of aluminium, light alloy or plastics.

According to the present invention in a sixth aspect there is provided a glazed structure including roofing 100 supportmembers, a row of generally upright members carrying the roofing support members and guttering at a junction line between the roof and the upright members, the guttering being so mounted that it cannot be seen from a location facing the said 105 row of upright members.

The various aspects of the invention will now be described, by way of example only, reference to the accompanying diagrammatic drawings in which:—

Figure 1 is a side elevation of one embodiment of 110 glazed structure in accordance with the invention;

Figure 2 is a section on the centre line of the glazed structure of Figure 1;

Figure 3 is a side elevation similar to Figure 1 but illustrating different sizes which can be built up from 115 the same basic components;

Figure 4 is a front view of the glazed structure of Figures 1 to 3;

Figure 5 is a sectional plan view, parts of which are omitted, of details of a door structure forming part of 120 the glazed structure as a whole;

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

- Figure 6 is a sectional plan view of a tie rail detail;
- Figure 7 is a sectional plan view of a corner post detail;
- Figure 8 is an outline sectional plan view illustrating a down pipe incorporated in parts of an upright of the glazed structure;
- 5 Figure 8a is a section of guttering forming part of the glazed structure;
- Figure 9 is a sectional plan view illustrating an "end" 10 upright;
- Figure 10 is a fragmentary vertical section illustrating a detail of a "sliding" door assembly forming part of the glazed structure;
- 15 Figure 11 is a further fragmentary section illustrating an upper end portion of the door assembly of Figure 10;
- Figure 12 is a cross section of a transverse bar member or tie forming part of the roof of the glazed structure and illustrating one end portion of an 20 opening vent; and,
- Figure 13 is a further fragmentary view of the vent assembly of Figure 12.
- Referring now to the drawings and in particular to Figures 1 and 3, the glazed structure illustrated is 25 intended for use as a conservatory or additional living space of a lean-to nature. The structure includes a plurality of uprights 20 of an end framework and a plurality of uprights 22 of a front framework. The uprights 20 of the end framework are interconnected 30 intermediate their lengths by transverse bars 24 and the uprights of the front framework are interconnected by transverse bars 26. It will be noted that as illustrated in Figures 1, 2 and 3 the uprights 22 of the front framework are not vertical but inclined, in the illustrated embodiment at 4 degrees from the vertical. The 35 precise angle is not, of course, critical and can be varied to suit design requirements.
- It is an important feature that the transitions 27 between the front frame "uprights" 22 and the 40 inclined roof bars are arcuate in side elevation, the rectangular section extended members being preferably bent by means of a tool and method in accordance with our co-pending application (Short Title "Bending Laminae").
- 45 The specification of this co-pending application describes a tool to enable a length of extruded at least substantially closed, non-circular, section extruded member to be bent, the tool comprising a plurality of laminae held together by securing means at one end 50 only and together forming a cross-sectional profile closely matched to the internal profile of the member to be bent, and having a length corresponding to the portion of the member to which a bend is to be applied.
- 55 The specification further described a method of imparting to a hollow generally closed section metal member a desired curvature comprising the steps of inserting a tool in accordance with the immediately preceding paragraph, applying a bending stress to the 60 member and after achieving the desired curved shape, withdrawing the tool by pulling axially on the tool at the end thereof where the laminae are secured together.
- The roof consists of a plurality of roof bars 28 which 65 terminate at a gutter 29 at their lower ends and at a ridge bar 32 at their upper ends. The roof structure also includes transverse tie rails 34 and an opening vent 36.
- Both at the front and at the sides the structure in 70 general terms is completed by a sill assembly 38.
- It will be apparent from Figures 3 and 4 that the overall size of the structure can readily be varied, both to increase and decrease the illustrated sizes.
- Reference will now be made to the various details as 75 illustrated in the remaining Figures.
- The glazed structure will normally include a "sliding" door and the detailed construction enabling incorporation in the glazed structure is shown in sectional plan view in Figure 5. To avoid incorporation 80 of unnecessary detail, parts have been omitted so that the Figure is effectively broken up into three component parts. Although this Figure is intended to show details of the door assembly, it also, inevitably, illustrates certain of the basic components of the structure, the description of which was outlined in 85 relation to Figures 1 to 4. A typical upright 22 is of generally square, box, section having on the inwardly directed face, two spaced, shallow, grooves 40 which serve merely a decorative purpose, two opposed 90 internal ridges or projections 42 which serve to increase the rigidity of the section, and two outwardly facing flanges 44 having at their free ends seal-receiving channels 46. The channels 46 are offset inwardly of the flanges 44 towards a central rib 48.
- 95 which projects with a substantially trapezoidal-section bead 50 slightly beyond the two channels 46.
- The bead 50 has the purpose of providing part of a connection to a cap strip 52 which has a generally shallow channel section with a central rib of substantially ogival cross-section 54 lying immediately opposite and parallel to the bead 50 of the projection 48. The cap strip has auxiliary channel sections 55 similar to the sections 46 of the member 40 and these serve a similar purpose of receiving parts of seal members.
- 100 The trapezoidal-bead section 50 and the ogival section projection 54 are interconnected by spaced clip members of strong but resilient plastics material which is capable of withstanding the stresses imposed when the two parts are being interconnected. An 105 example of a suitable material is sold under the trade name "Kemetal" and is without pigment. Each plastics connector 56 is profiled so that it has a generally H-section appearance with the lower part (as shown) having a groove of ogival-section 58 which 110 extends beyond the corresponding cross section of the rib 54 as a slot 60 which facilitates flexing the corresponding part of the connector as it is snapped into position. Again to facilitate location of the connector on the cap strip the opening to the 115 ogival-section is chamfered at 62.
- The upper half (as shown) of the connector is formed with two beaked extensions 63 lying on opposite sides of a central ridge 64. As will be apparent from the Figure the substantially trapezoidal-section bead 50 of the projection 48 is engaged on its undersurface by the beaks 63 and abuts the free surface of the ridge 64 to ensure precision in location and a tight gripping action on the head.
- 120 The portions of each clip 56 which engage parts of 125 opposed members such as 22 and 52 are of different

configurations so that if and when it is desired to disassemble the opposed members, one portion of each clip will remain connected preferentially. As illustrated in Figure 5, the clips will remain connected 5 to the member 22 as the beaked extensions 63 have higher resistance to disassembly. Preferably the clips are made of Kemetel Natural M 90/04 of lubricated injection moulded grade. Other high strength, low-thermal conductivity plastics can be also be used.

10 The auxiliary channels 55 of the cap strip 52 and the channels 46 of the main upright 22 receive as illustrated in Figure 5 a trim strip 66 and natural or synthetic rubber sealing strips 68 for a pane of glass 70. The trim strip comprises a central body 72 of 15 generally rectangular section but having opposed concave faces 74 and along the lower edge (as shown) a rectangular section rib 76 which engages in the auxiliary channel of the cap strip while the opposed shorter edge has a ridge 78 of T-section which enables 20 it to be retained in the channel 46. The trim strip is preferably of white plastics but can, of course, be of any preferred colour including a colour matching that of the aluminium or light alloy of the extrusions. As will be apparent because of the rectangular section 25 ridge 76 the trim strip does not serve any structural purpose but is used wherever an opening or an end of the glazed structure as a whole is called for.

The pane of glass 70 is retained between the two seal strips 68 of natural or synthetic rubber, each seal 30 being of generally trapezoidal-section with a T-section projection extending from the shorter parallel side and being engaged in the auxiliary channel 55 of the cap strip and one of the channels 46 of the main upright 22. The sealing members are so dimensioned 35 that when compressed between the cap strip 52 and the main upright 22 the reduction in their height dimension is approximately 20 percent. This ensures a leak-proof window assembly.

Although the upright and cap strip assembly as just 40 described is incorporated in the door structure it will be readily apparent from Figures 7, 8 and 9 that the upright member 22 and the cap strip 52 are repeated in each of these Figures. The doors each comprise frame members 80 of rectangular box section with two 45 flanges 82 forming extensions of the longer sides and accommodating between them a natural or synthetic rubber sealing strip 84 of channel section but having approximately rectangular or square section passages 85 extending along its length. A pane of glass 86 50 is held by the seal 84. Adjacent uprights of the frame members of the doors 80 are modified to incorporate a conventional lock assembly 88 by the incorporation of additional flanges on the right-hand upright door member (as shown) referenced 90 which constitute 55 extensions of the box section of the member and in the left-hand member (as shown) extensions 92 disposed parallel to but inwardly of the extensions 90 and receiving in channel section recesses 94 draught-proofing strips 96. The outer uprights 80 of each door 60 also have channel-section recesses 98 which receive draught-proofing strips 100. The lock assembly has handles 101.

Transverse members 26 supporting the glass panes 70 will be described with reference to Figure 6 which 65 illustrates a tie rail detail such as form part of the

upright structure and referenced 34 in Figure 2 and 26 in Figure 4. The tie rail comprises a length of cap strip 52 (i.e. as used with the uprights 22 of Figure 5) and a cover strip 102. The two parts are interconnected with 70 a series of the connectors 56 of identical form to those illustrated in Figure 5 and the features therefore will not be further described. The cover strip 102 comprises an aluminium or light alloy extrusion of very shallow channel section with auxiliary channels 104 at 75 each longitudinal edge and these serve to accommodate window seal strips 68. Centrally, the cover strip has a ridge 106 with a substantially trapezoidal-section bead 108 of the same form as the bead 50 of the ridge 48 of the main upright members. Two 80 self-tapping screws 110 are illustrated merely to indicate the manner of securing the tie rail to other members without the screws being visible either internally or externally of the glazed structure as a whole. Tie rail assemblies such as 52, 102 are secured 85 to an upright such as shown in Figures 5 and 7 by forming an opening in one of the flanges 44 and inserting an end portion of the member 52. The member is firmly secured by a pair of self-tapping screws 110 (only one shown). Access for tightening 90 purposes is provided by an aperture in the adjacent channel member 46.

Turning now to Figure 7 in which a corner post detail is illustrated, it will be readily apparent that the main upright 22 is identical to those illustrated in Figure 5.

95 The same applies to the cap strip 52 and the connectors 56. The manner in which the tie rail 26 is secured by self-tapping screws 110 (only one visible) is readily apparent. A slot is formed at the side of the flange member 44 including, locally, the channel 46 so 100 that the self-tapping screw can be tightened and subsequently the seal 68 is inserted followed by the pane of glass 70 and the cap strip and associated elements including the connectors 56. As will be apparent the channel members 46 which are not 105 occupied by window receiving seals receive lengths of the trim strip 72.

Connection is made to the side framework of the glazed structure as a whole by an extruded aluminium or light alloy member 112 of generally channel 110 section, the base 114 of which has two shallow grooves 116 which serve merely a decorative purpose, the side limbs 118 being outwardly cranked adjacent their free ends and the free ends carrying inwardly directed, opposed, flanges 120 having seal-receiving 115 auxiliary channels 122 facing one another and each receiving a sealing member. One sealing member is identical to the sealing member 68 referred to with reference to Figure 6. The other sealing member 124 is of substantially larger cross section and is of irregular 120 quadrilateral section with lips 126, 128 adjacent two corners, the former being in tight contact with a pane of glass 70 and the latter, 128 being received in the opening of the auxiliary channel 122. The cranked form of the limbs 118 enables a bolt assembly 130 to 125 be readily accommodated and by a spaced series of such assemblies to interconnect securely the upright 22 with the channel section member 112. Once again, it will be readily apparent from inspection of the drawings that the bolt assemblies 130 are not visible 130 after the glazed assembly as a whole has been

completed.

The seal 124 is appreciably thicker than the other seals employed in the structure because it has to take up space which would, in an alternative, be used to accommodate a double-glazing unit. The associated channel section member 112 is symmetrical so that it can be used in a non-handed manner and it can be easily bent. The bolt assemblies 130 are conventional components sold under the trade name "Rivnut" and can be used to provide a thread-form in thin materials.

Referring now to Figure 8, an upright 20 of the side framework is illustrated and is of identical section to upright 22 of Figure 5. Self-tapping screws 110 are illustrated which serve to connect the upright 20 to a cleat by which, in turn, connection is made to a gutter 29 as illustrated in Figure 8a. A pane of glass 70 is held by the cap strip assembly and connectors 56 as in Figure 5. On the outside of the cap strip a drain down pipe 142 is illustrated which is connected as illustrated in Figure 8a to the gutter 29 of channel section and the joint is completed by a PVC sealing spigot 144. As will be apparent from Figures 1, 2 and 3, the gutter is fully recessed at the junction between the arcuate portion of the upright members 22 of the glazed structure and the roof bars 28 and will be not be apparent from inspection at ground level as viewed from the front of the structure as defined by the front series of uprights. The down pipe 142 is secured to the cap strip 52 by self-tapping screws (not shown) which pass through flanges 143 engaging the outside of the cap strip. The channel section gutter member 29 has inturned flanges 140 carrying sealing strip grooves 141 as will be further described with reference to Figure 11.

Figure 9 merely illustrates a typical upright member 35 20 of the side frame and cap strip 52 serving to support one edge of a glass pane 70. A self-tapping screw 110 is illustrated (the other screw being not shown) which serves to secure an end portion of a tie rail 24. A trim strip 72 completes the upright assembly. As will be apparent from each one of Figures 5 to 9 the various upright members are all mounted on the sill structure 38 illustrated only as a rudimentary outline in these Figures.

Reference will now be made of Figure 10 which shows a fragmentary cross-section of the sliding door assembly and of the associated sill 38. The latter is typical of the sill extrusion of the glazed structure as a whole. As will be apparent from Figure 10, the sill structure essentially comprises a plane but inclined 50 portion 150 having at its lower end a downwards extension 152 carrying at the free end a channel 154 which serves to receive a sealing strip (not shown). To provide support on a base structure 156, two feet 158, 160 are provided. From the upper end of the inclined 55 member 150 a vertically upwards extension 162 carries a horizontal strip 164 which in turn supports the lower end of one of the uprights 20 or 22. The strip 164 carries a dependent L section extension 166 and a laterally-open channel 168 which receives one of the 60 seal members 68 of the same form as illustrated in Figure 5. The pane of glass 70 is additionally sealed by mastic strip 170 engaged on a thin-sectioned, inverted, channel-section member 172 having a flange 174 which engages in the mastic strip and holds it in place.

The L section portion 166 of the sill has a recess in which parts of the channel section member 172 are received and held and depending from the left hand end (as shown) of the horizontal part of the L section

70 portion is a guide-wheel receiving channel 176 having an upper, downwardly-facing, track 178 of approximately semi-circular cross-section, the channel 176 being completed by a separate member 180 defining a lower, arcuate section track for a support and guide 75 wheel 182 of a door. Part of the channel 176 is integral with the inclined portion 150 of the sill.

Figure 11 illustrates the guide arrangement for the upper end of the door at the edge just beyond the curved, arcuate portion thereof and as for previous 80 Figures, like parts have been given the same reference numerals. The upper edge of the frame of the door is generally similar to the lower frame member 82 but has in addition a closure plate 190 to the channel in which the form as illustrated in Figure 10 is open. The 85 thus formed box section carries at one edge (the lower edge as shown) an inclined extension plate 192 which in turn rotatably supports guide rollers 194 (only one shown) spaced along the extension plate 192. The upper edge portion of the arcuately curved pane of 90 glass 70 is received between a mastic strip 170 and a seal 68. The gutter member 29 is modified at the section associated with the upper edge of the door by the addition of an extension 196 extending parallel to the base of the channel and having an upstanding 95 edge portion 198 by which it is secured to a flange 200 of a channel section member 202 which channel itself acts as a guide for the guide rollers 194. At the edge portion opposite to the flange 200 a further flange 204 parallel to the first mentioned flange 200 serves to 100 support the mastic strip 170 sealing against one of the panes 70 of the static part of the structure. In order to provide a draughtproof seal with the upper edge portion of the sliding door, the channel section member 202 has an auxiliary channel formed on a 105 flange 206 which carries a draughtproof strip 208.

The flange 200 of the channel section member 202 also carries a further extruded member 210 which ensures that the rollers are weather-protected and is in the form generally of an angle section having a 110 flange 212 by which it is secured to the flange 200 by means of a plurality of nut and bolt assemblies 214. A draughtproof strip 216 is mounted in a T-section slot 218 provided at the end of the channel section member 210 remote from its securing flange 212.

115 As illustrated in Figure 11, the right-hand (as shown) limb of the gutter section member 29 has an upturned flange 220 which receives a slightly resilient extruded, metal member 222. The cross-section of this extruded member 222 includes a securing portion 223 by which 120 it is attached to the flange 220 and a cover portion 224 which serves to hold in position a seal 226 applied to the outer face of the inclined roofing glass pane 70. The securing portion 223 is essentially of U-section and lies adjacent the junction with the cover portion 125 224. An arcuate section extension 228 extends downwardly from this junction. A further securing portion 225 is redundant in the illustrated embodiment, but will be used in place of portion 223 in a double-glazed embodiment.

130 Reference will now be made to Figures 12 and 13

- which together illustrate a vent 240 which may be disposed in any part of the roof by simple modification of the components of the assembly. As will be readily apparent, the tie rail 34 includes a cap strip 52 and a
- 5 cover strip 3 having a shallow profile so that water run-off will not be hindered. The strip 302 has a central portion 304 with the wings 306 at a shallow angle to the central portion 304. Inwardly facing, substantially dovetail section ribs 308 serve to retain resilient
- 10 sealing strips 310 which are applied against the roof glass. As for cover strip 102 a bead 312 extend from the central portion 304 and is engaged by the clips 56. Connector clips 56 thus serve the same purpose as in Figure 6. At the lower portion of the vent 240
- 15 illustrated in Figure 12 an extruded aluminium or light alloy member 242 is fitted between the cap strip 52 and the roofing cover strip 302 and includes two flanges 244, 246 one of which has a lip 248 engaging over the inner face of one of the auxiliary channels of
- 20 the cap strip 52. The flanges 244 and 246 are integral with the generally L-section member 242 adjacent the corner thereof and the L-section member further includes two screw-receiving, part-circular channels 250 one of which adjacent the free edge also has a
- 25 T-section slot for receiving a seal strip (not shown). To the left, as shown, the edge portion of the member 242 also carries a part-circular section portion the purpose of which is to be described hereinafter in connection with the hinging of the vent.
- 30 The free edge of the other limb the member 242 also carries a portion 254 of the channel section which serves the purpose of carrying a pile seal (not shown) of polypropylene (or other plastics material of appropriate, equivalent properties). The lower edge
- 35 portion of the vent is completed by a further extrusion forming a part of the framework of the opening vent itself and is referenced 260. This extrusion is based on a box section 261 having in one corner a part-circular channel 262 enabling a screw to be inserted at the
- 40 mitred corner of the vent framework. The box section 261 extends from the same corner to a flange 264 carrying at right angles thereto an integral weathering strip 265 having at its free edge an arcuate section 266 which covers, in the closed position, the outer edge
- 45 portion of one limb of the L-section member 242. The weathering strip 265 at one side of the box section of the member 260 receives a U-section seal 270 which in turn receives the pane of glass 272 of the vent. Preferably, the U-section seal 270 has internal lips 274
- 50 which engage tightly against the edge portion of the pane 272 and external lips 273 at the free edges which engage a part of the box section and a free edge of the strips 265.
- Turning now to Figure 13, the upper edge portion of
- 55 the frame of the vent is of generally similar section to the member 260 but is slightly modified by the inclusion, adjacent the arcuate section 266 of a ridge 276 integral with a circular section bead 278 which is received in the part circular channel 279 of the
- 60 L-section member 242. This beading 278 provides the hinge to enable opening of the vent. The part-circular channel 279 in fact extends over an arc of 186° in cross-section and since the channel extends the full length of the bead 278, disengagement under the
- 65 action of suction generated by wind forces is impossi-
- ble. Again as illustrated in Figure 12, the two flanges 244, 246 serve a securing purpose and the lip 248 engages over one edge of a T-section channel 280 of the ridge bar 32 of the glazed structure.
- 70 The ridge bar 32 is, like all the other main components, of extruded aluminium or light alloy and is a somewhat complex section. It is based on a unequal and irregular channel having a base 282, a shorter side limb 284 and a longer side line 286, the
- 75 latter being non linear. Both side limbs have inturned flanges 288. Externally, the longer limb 286 of the channel section has a longitudinal ridge carrying an ogival section bead 292 which, as illustrated, carries a plurality (only one shown) of connectors 56 of
- 80 identical form to those illustrated in Figure 5. The ridge bar 32 also has an extension 293 of planar form extending parallel to the flanges 288 and adjacent that one associated with the longer limb 286 of the channel section. This extension has a plurality of apertures for
- 85 the passage of bolts 295 by which the ridge bar will be connected to a main structure of a building. The extension 293 is prolonged by a generally S-section portion 294 which has a V-section recess 296 receiving a correspondingly sectioned seal (not shown) which is
- 90 incorporated when the ridge bar is secured to the main structure. The S-section portion 294 may be extended to provide a further V-section recess (not shown) such as 296 in order to provide a secondary seal.
- To provide weatherproofing the ridge bar 32 is
- 95 completed by a roofing cover member 302 generally similar to that illustrated in Figure 12, sealing strips 310 lying beneath the roofing cover strip 302 and engaging the flange 244 and a part of the S-section portion 294. The roofing cover strip 302 is secured to
- 100 the ridge bar by means of the connectors and the rib with its trapezoidal bead 312. The ridge bar 32 also provides the termination for the roof bars, securing being effected by a cleat 300 (broken lines) and at least two stainless steel self-tapping screws 302 (broken lines). The cleat 300 has a section generally corresponding to the internal section of each upright channel section member 22 but to limit friction each face of the cleat is recessed to provide a relatively close fit only at corners. At the assembly stage, the
- 105 cleat will be initially secured to the ridge bar by the screws 302 and then the roof bar will be secured to the cleat by transverse screws (not shown) which will finally be hidden from view by one of the cap strips 52.
- It is believed that it will be apparent from the
- 110 description relating to the detailed drawings that the glazed structure illustrated satisfies the very important requirement that no fixings should be visible either externally or internally of the structure, that the number of extruded sections is low, that the assembly
- 115 is a very straightforward matter which could even be carried out by an inexperienced person, that weatherproofing and draughtproofing is near perfect and that the heat transfer from the inside to the outside is kept reasonably low by the provision of thermal break
- 120 sections with the aid of the plastics connectors 56.
- It is also believed apparent that many of the features of the different aspects of the invention can be employed independently of the illustrated structure, in particular the connecting clips of plastics material,
- 125 130 the door assembly, the gutter assembly and downpipe

and the plastics filler strips. From Figure 3 it is apparent that the size of the structure as a whole can be varied according to requirements from the width stand point and from Figure 4 the length can be varied by omitting or increasing the number of uprights and associated parts.

Although not illustrated, the glazed structure can readily be modified to accommodate double glazing, merely by increasing appropriate dimensions. The 10 connectors 56 are made of increased length.

The extruded members hereinbefore referred to are described as being of extruded metal (apart from the thermal break members); it will, however, be evident that some at least may be extruded, solid or rigid 15 framed plastics.

#### CLAIMS

1. A plastics clip serving to interconnect two aluminium or light-alloy extrusions, the clip being of generally H section with one end defining a slot of 20 appropriately ogival section which serves to engage with a snap action, a part of an aluminium or light alloy extrusion and at the other end a slot defined by two flange-like members with lips adjacent their free ends, the lips being adapted to snap over a part of a rib of 25 another aluminium or light alloy extrusion, the configuration of the parts of the clip defining the slots differing at the one end from that at the other.

2. A plastics clip according to claim 1, wherein the slot of ogival section extends at its blind end to a 30 further slot of rectangular section, the further slot serving to aid flexibility of the ogival section slot.

3. A plastics clip according to claim 1 or 2, wherein the opening to the ogival slot is chamfered.

4. A plastics clip according to any one of claims 1 35 to 3, wherein the lips of the flange-like members have inwardly directed faces extending at right angles to the flange members themselves.

5. A plastics clip according to any one of the preceding claims comprising a ridge within the slot 40 defined by the flange-like members, the ridge serving as a location for a part of a member engaged by the clip.

6. A plastics clip according to any one of the preceding claims, wherein the clip is symmetrical 45 about one axis and asymmetrical about an axis orthogonal to the one axis.

7. A plastics clip substantially as hereinbefore described with reference to the accompanying drawings.

50 8. A kit of parts for forming a glazed structure comprising aluminium, light alloy or plastics extrusions including uprights, at least one roof bar, at least one ridge bar and roof ties, the transition section in each upright to the corresponding roof bar being of 55 arcuate form and the component parts being interconnected by securing means which are invisible both internally and externally of the assembled structure.

9. A glazing structure comprising aluminium, light alloy or plastics extrusions formed as uprights and as 60 roofing bars and further comprising transverse members interconnecting the uprights and further transverse members interconnecting the roofing bars, the members forming the roofing bars having a capping member which serves to secure the glazing and the 65 transverse and further transverse members each

including a said capping member and a further, external cover member.

10. An assembly including a cleat interconnecting two aluminium, light alloy or plastics extrusions, the 70 said cleat having an external profile corresponding substantially to the internal profile of one of the extrusions to be connected, apertures in the cleat capable of receiving self-tapping screws, means defining screw-receiving apertures serving by means 75 of self-tapping screws to lock the cleat in a required position on a portion of the other of the extrusions to be connected, and further self-tapping screws passing through and engaging in the first-mentioned apertures of the cleat whereby to secure the said one member to the cleat and all said screws being so mounted that in the assembled condition they are hidden by other components associated with the extrusions.

11. A sliding door assembly comprising a lower 85 support track formed of an aluminium, light alloy or plastics extrusion of rectangular or square section, rollers rotatable on axes transverse to a lower portion of a door, each roller being mounted in an antifriction bearing, the door having a profile including a curved 90 upper portion and carrying at or adjacent the upper edge further rollers which engage a guide formed by an extended section member of aluminium, light alloy or plastics.

12. A glazed structure including roofing support 95 members, a row of generally upright members carrying the roofing support members and guttering at a junction line between the roof and the upright members, the guttering being so mounted that it cannot be seen from a location facing the said row of 100 upright members.

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